
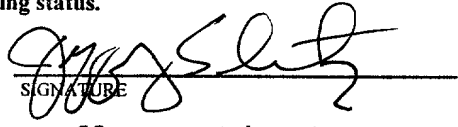


FORM PTO-1390 (REV 11-2000)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 148/257	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO (If known, see 37 CFR 1.5)	
				09/763105	
INTERNATIONAL APPLICATION NO. PCT/GB99/02669		INTERNATIONAL FILING DATE August 12, 1999		PRIORITY DATE CLAIMED August 20, 1998	
TITLE OF INVENTION IMPROVEMENTS IN AND RELATING TO DATA PROCESSING APPARATUS AND VERIFICATION METHODS					
APPLICANT(S) FOR DO/EO/US ABDULHAYOGLU, Melih					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> has been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).</p> <p>a. <input type="checkbox"/> is attached hereto.</p> <p>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> have been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</p> <p>9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). - <u>UNSIGNED</u></p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p>					
Items 11 to 20 below concern document(s) or information included:					
<p>11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment.</p> <p>14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</p> <p>18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4).</p> <p>19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).</p> <p>20. <input checked="" type="checkbox"/> Other items or information: <u>Amended Claims</u></p>					

U.S. APPLICATION NO. (if known) 09/763105 INTERNATIONAL APPLICATION NO. PCT/GB99/02669		ATTORNEY'S DOCKET NUMBER 148/257	
21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO..... \$1000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =		CALCULATIONS PTO USE ONLY <div style="font-size: 2em; margin: 10px 0;">\$ 860.00</div>	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		<div style="font-size: 1.5em; margin: 10px 0;">\$ 130.00</div>	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	20 - 20 =	0	x \$18.00
Independent claims	2 - 3 =	0	x \$80.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$270.00
TOTAL OF ABOVE CALCULATIONS		= \$ 00	
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.		+	
SUBTOTAL		= \$ 495.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).		+	
TOTAL NATIONAL FEE		= \$ 495.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property		+	
TOTAL FEES ENCLOSED		= \$ 495.00	
		Amount to be refunded:	\$
		charged:	\$
a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>495.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>01-0265</u> . A duplicate copy of this sheet is enclosed. d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.			
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.			
SEND ALL CORRESPONDENCE TO: ADAMS, SCHWARTZ & EVANS, P.A. 2180 Two First Union Center Charlotte, NC 28282 (704) 375-9249			
 23638		<div style="text-align: center;">  SIGNATURE Jeffrey J. Schwartz NAME <u>37,532</u> REGISTRATION NUMBER </div>	

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: ABDULHAYOGLU, Melih

INTERNATIONAL
APPLICATION NO.: PCT/GB99/02669

INTERNATIONAL
FILING DATE: August 12, 1999

FOR: IMPROVEMENTS IN AND RELATING TO DATA PROCESSING
APPARATUS AND VERIFICATION METHODS

BOX PCT
Assistant Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

After the assignment of a serial number and prior to the initial examination of the above-identified patent application, please make the following amendments:

IN THE SPECIFICATION:

Amend the specification by inserting after the title, but before the first sentence on page 1:

--This application is a national stage application, according to Chapter II of the Patent Cooperation Treaty.--

09/763105

APPLICANT: ABDULHAYOGLU, Melih
INTERNATIONAL
APPLICATION NO.: PCT/GB99/02669

IN THE CLAIMS:

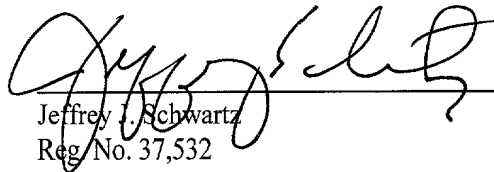
Cancel original claims 1 - 20.

Add claims 1 - 20 as attached entitled "Amended Claims."

REMARKS

It is believed that this application is now in condition for allowance. Such action at an early date is respectfully requested.

Respectfully submitted,


Jeffrey J. Schwartz
Reg. No. 37,532

Jeffrey J. Schwartz
ADAMS, SCHWARTZ & EVANS, P.A.
2180 First Union Plaza
301 S. Tryon Street
Charlotte, NC 28282
TEL: (704) 375-9249
FAX: (704) 375-0729
E-Mail: jjis@adamspat.com
File No. 148/257

Amended Claims

1. In a data processing apparatus comprising a first input channel and a second input channel each for inputting signals, a security device for verifying a password, and means for determining whether the password input to the security device comes from the second input channel, in which the security device will verify a correct password from the first input channel, but not from the second input channel, in which the security device is configured to receive signals from the first input channel and configured not to receive signals from the second input channel.
2. A data processing apparatus according to claim 1, in which the device receives signals only from the first input channel.
3. A data processing apparatus according to claim 1, in which the device cannot receive signals from the second input channel.
4. A data processing apparatus according to claim 1, in which the apparatus further comprises means to determine whether the security device has verified the password and, if not, to vary operation of the apparatus.
5. A data processing apparatus according to claim 1, in which the first input channel comprises a first peripheral input device.
6. A data processing apparatus according to claim 5, in which the first peripheral input device comprises a keyboard and the security device is located to receive signals from the keyboard and transmit them to a keyboard controller or to a bus.

7. A data processing apparatus according to claim 5, in which the device is located between the keyboard controller and the keyboard bus.
8. A data processing apparatus according to claim 1, in which the apparatus further comprises a control unit (such as a CPU) which interrogates the security device to determine whether a correct password has been entered.
9. A data processing apparatus according to claim 1, in which the device encrypts all signals it receives.
10. A data processing apparatus according to claim 9, in which a decryption tool is provided between the output of the device and the application to which they key presses comprise instructions.
11. A method of verifying which of a first input channel and a second input channel is used in data processing apparatus, the method comprising the steps of upon input of a password to the apparatus, a security device receiving input from the first input channel not from the second input channel declining password authorisation, if the input is through the second input channel, and if the correct password is input through the first input channel providing a password verification.
12. A method according to claim 11, in which the method includes the step of determining whether the security device has verified the password and, if not, varying the operation of the apparatus.

13. A method according to claim 12, in which a control unit (such as a CPU) interrogates the security device to determine whether the correct password has been entered.
14. A method according to claim 11, in which the method includes the step of receiving signals only from the first input channel.
15. A method according to claim 14, in which the data processing apparatus includes a device for receiving signals.
16. A method according to claim 14, in which the device cannot receive signals from the second input channel.
17. A method according to claim 11, in which the first input channel comprises a first peripheral input device.
18. A method according to claim 17, in which the first peripheral input device comprises a keyboard and the security device is located to receive signals from the keyboard and transmit them to a keyboard controller or to a bus.
19. A method according to claim 17, in which the device is located between the keyboard controller and the keyboard bus.

20. A method according to claim 11, in which the apparatus further comprises a control unit (such as a CPU) which interrogates the security device to determine whether a correct password has been entered.

IMPROVEMENTS IN AND RELATING TO DATA PROCESSING APPARATUS
AND VERIFICATION METHODS

Field of the Invention

5

The present invention relates to data processing apparatus and to verification methods.

Background to the Invention

10

Despite the growing proliferation of computer hardware and software, there are still serious problems associated with data entry, and with the security of both hardware and software. Many new problems have arisen and others have become exacerbated as more and more computers are networked together and linked to the internet. One particular problem is that of remote hacking in which an unauthorised user seeks access to a computer or computer network by accessing the computer or a computer on the network otherwise than through a local keyboard or other local peripheral input device.

The present invention aims to provide in preferred embodiments thereof, data processing apparatus and verification methods that address at least one of these problems.

Summary of the Invention

30

According to the present invention in a first aspect, there is provided in a data processing apparatus comprising a first input channel and a second input channel each for inputting signals, a security device for verifying a

password, and means for determining whether the password input to the security device comes from the second input channel, in which the security device will verify a correct password from the first input channel, but not from the second input channel, in which the security device is configured to receive signals from the first input channel and configured not to receive signals from the second input channel.

10 In this way, the device determines whether the password input thereto comes from the second input channel, ie it physically cannot come from this channel.

Suitably, the device receives signals only from the first input channel. Suitably, the device cannot receive signals from the second input channel.

Suitably, the apparatus further comprises means to determine whether the security device has verified the password and, if not, to vary operation of the apparatus. Normally, the variation will be a restriction in operation, typically it will render the apparatus unusable.

Suitably, the first input channel comprises a first peripheral input device. Suitably, the first peripheral input device comprises a keyboard and the security device is located to receive signals from the keyboard and transmit them to a keyboard controller or to a bus. Suitably, the device is located between the keyboard controller and the keyboard bus. Here, "between" is in the electronic sense, ie receives output from the keyboard controller and generates an input for the keyboard bus.

The device thus acts as an interface between the keyboard controller and the bus.

Suitably, the apparatus further comprises a control
5 unit (such as a CPU) which interrogates the security device to determine whether a correct password has been entered. A password protected operation is performed only if the control unit receives such verification.

10 Suitably, the device encrypts all signals it receives. Suitably, a decryption tool is provided between the output of the device and the application to which they key presses comprise instructions.

15 According to the present invention in a second aspect, there is provided a method of verifying which of a first input channel and a second input channel is used in data processing apparatus, the method comprising the steps of
20 upon input of a password to the apparatus, a security device receiving input from the first input channel not from the second input channel declining password authorisation, if the input is through the second input channel, and if the correct password is input through the first input channel providing a password verification.

25

Suitably, the method includes the step of determining whether the security device has verified the password and, if not, varying the operation of the apparatus. Normally, the variation will be a restriction in operation.
30 Typically, it will render the apparatus unusable.

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Suitably, a control unit (such as a CPU) interrogates the security device to determine whether the correct password has been entered.

5 Suitably, the method includes the step of receiving signals only from the first input channel. Suitably, the data processing apparatus includes a device for receiving signals. Suitably, the device cannot receive signals from the second input channel.

10

Suitably, the first input channel comprises a first peripheral input device. Suitably, the first peripheral input device comprises a keyboard and the security device is located to receive signals from the keyboard and
15 transmit them to a keyboard controller or to a bus. Suitably, the device is located between the keyboard controller and the keyboard bus. Here, "between" is in the electronic sense, ie receives output from the keyboard controller and generates an input for the keyboard bus.
20 The device thus acts as an interface between the keyboard controller and the bus.

Suitably, the apparatus further comprises a control unit (such as a CPU) which interrogates the security device
25 to determine whether a correct password has been entered. A password protected operation is performed only if the control unit receives such verification.

Brief Description of the Figure

30

The present invention will now be described, by way of example only, with reference to the Figure that follows

which is a schematic illustration of an electronic data processing apparatus embodying the present invention.

Description of the Preferred Embodiments

5

In one preferred embodiment of the present invention, there is provided an electronic data processing apparatus, typically a personal computer ("PC") 2. The PC 2 receives input signals from peripheral input devices (eg keyboard, data socket, pen, voice recognition microphone etc). The PC includes a keyboard 4 having an associated bus 6 and a keyboard controller 8 forming a first input channel from the keyboard 4. The PC 2 also has at least one further input channel 10 for signals corresponding to those from the keyboard 4. Typically, this further input channel 10 will comprise a data socket for receipt of digital signals transmitted from a remote modem (not shown). The PC 2 generally treats signals received via the data socket in the same way as those received from the keyboard 4, except as set out below.

A security device 12 is located between the keyboard controller 8 and the bus 6. That is, the security device 12 is located to receive signals from the first input channel (the keyboard 4), but not from the further input channel (the data socket 10). The security device 12 has the following characteristics.

- (i) It includes a fast and reversible encryption/decryption algorithm such as DES or T-code.

(ii) It has a volatile memory Random Access Memory (RAM) including authorisation codes or an algorithm therefor, or pre-stored password and means for checking whether an input password or code matches such an authorisation code or password.

(iii) It includes a real-time clock powered by a power supply.

10

The security device 12 is typically embodied in a board (not shown) including a microprocessor. The board may be integral to the PC 2 or be a separate plug-in board.

15 The security device 12 requires a password to be input to pass keyboard signals to the bus 8. If the password is not provided on demand (a limited number of tries may be permitted before a lock-out) the security device 12 will either block signals or vary them, for instance by
20 encryption, to be unusable. The security device 12 is configured so that upon receipt of the correct password it is activated for a predetermined period of time, according to the in-built real-time clock. The period of time can be varied based upon the password or other authorisation
25 received. While activated, the security device 12 transmits keyboard signals unaltered. When not activated it is in the encryption state and encrypts signals passing therethrough (or may block them). Thus, while in the encryption state the central processing unit ("CPU") of PC
30 2 cannot understand the output of keyboard 8.

The security device 12 when activated and authorised receives input signals from the keyboard bus and outputs

them to the keyboard controller. The delay is insignificant.

In use, the PC 2 is configured to require a password
5 before permitting access to certain functions or data
(which may be all functions and/or data). By way of
example, a word-processing file may be password protected.
Before permitting access to the file, the PC CPU requires
confirmation from the security device 12 that the correct
10 password has been entered. Only if the CPU receives
verification from the security device that the correct
password has been entered will it perform the password
protected operation. Since the security device 12 can only
receive inputs from the keyboard, it is not possible to
15 enter the password from any other source.

In this way, it is possible to verify the physical
presence of a user. If signals are input to the PC via a
modem, for instance from a "hacker", it will not be
20 received via the keyboard input channel and so the password
cannot be verified. Thus access can be denied to remote
users or additional security measures put in place before
allowing them access.

25 Typically, data will be encrypted and decryption will
only be permitted upon verification from the security
device 12.

Preferred embodiments of the present invention also
30 enable a security enhancement to be provided to prevent
"key logging" attacks. This is where a hacker loads a
short application on to a PC to be attached which
application interrogates the operating system to determine

each keystroke as it is pressed. A record of keystrokes can be used to inspect confidential information and/or retrieve passwords.

5 To prevent this the security device 12 can be set to encrypt all key presses according to a predetermined encryption algorithm. An encryption algorithm is used to ensure that generally a given key press when repeated does not generate as an output from the security device 12 the
10 same output. A tool is additionally provided between the operating system and the application to be controlled by the key presses to decrypt the encrypted key press data. Therefore since the key press information available to the operating system is encrypted it is of no use to a key
15 logger.

Although reference is made herein to a "password", that can comprise any signal or combination of signals and need not be a "word" at all.

20

Clearly, in certain embodiments the apparatus may only verify input from other inputs, usually being peripheral input devices.

25 The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and
30 documents are incorporated herein by reference.

All of the features disclosed in this specification (including any accompanying claims, abstract and drawings),

and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

5

Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated
10 otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the
15 foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so
20 disclosed.

Claims

1. In a data processing apparatus comprising a first input channel and a second input channel each for inputting
5 signals, a security device for verifying a password, and means for determining whether the password input to the security device comes from the second input channel, in which the security device will verify a correct password from the first input channel, but not from the second input
10 channel, in which the security device is configured to receive signals from the first input channel and configured not to receive signals from the second input channel.
2. A data processing apparatus according to claim 1, in
15 which the device receives signals only from the first input channel.
3. A data processing apparatus according to claim 1 or claim 2, in which the device cannot receive signals from
20 the second input channel.
4. A data processing apparatus according to any preceding claim, in which the apparatus further comprises means to determine whether the security device has verified the
25 password and, if not, to vary operation of the apparatus.
5. A data processing apparatus according to any preceding claim, in which the first input channel comprises a first peripheral input device.
30
6. A data processing apparatus according to claim 5, in which the first peripheral input device comprises a keyboard and the security device is located to receive

signals from the keyboard and transmit them to a keyboard controller or to a bus.

7. A data processing apparatus according to claim 5 or
5 claim 6, in which the device is located between the keyboard controller and the keyboard bus.

8. A data processing apparatus according to any preceding
claim, in which the apparatus further comprises a control
10 unit (such as a CPU) which interrogates the security device to determine whether a correct password has been entered.

9. A data processing apparatus according to any preceding
claim, in which the device encrypts all signals it
15 receives.

10. A data processing apparatus according to claim 9, in
which a decryption tool is provided between the output of
the device and the application to which they key presses
20 comprise instructions.

11. A method of verifying which of a first input channel
and a second input channel is used in data processing
apparatus, the method comprising the steps of upon input of
25 a password to the apparatus, a security device receiving input from the first input channel not from the second input channel declining password authorisation, if the input is through the second input channel, and if the correct password is input through the first input channel
30 providing a password verification.

12. A method according to claim 11, in which the method includes the step of determining whether the security

device has verified the password and, if not, varying the operation of the apparatus.

13. A method according to claim 12, in which a control unit
5 (such as a CPU) interrogates the security device to determine whether the correct password has been entered.

14. A method according to any one of claims 11 to 13, in which the method includes the step of receiving signals
10 only from the first input channel.

15. A method according to claim 14, in which the data processing apparatus includes a device for receiving signals.

16. A method according to claim 14 or claim 15, in which the device cannot receive signals from the second input channel.

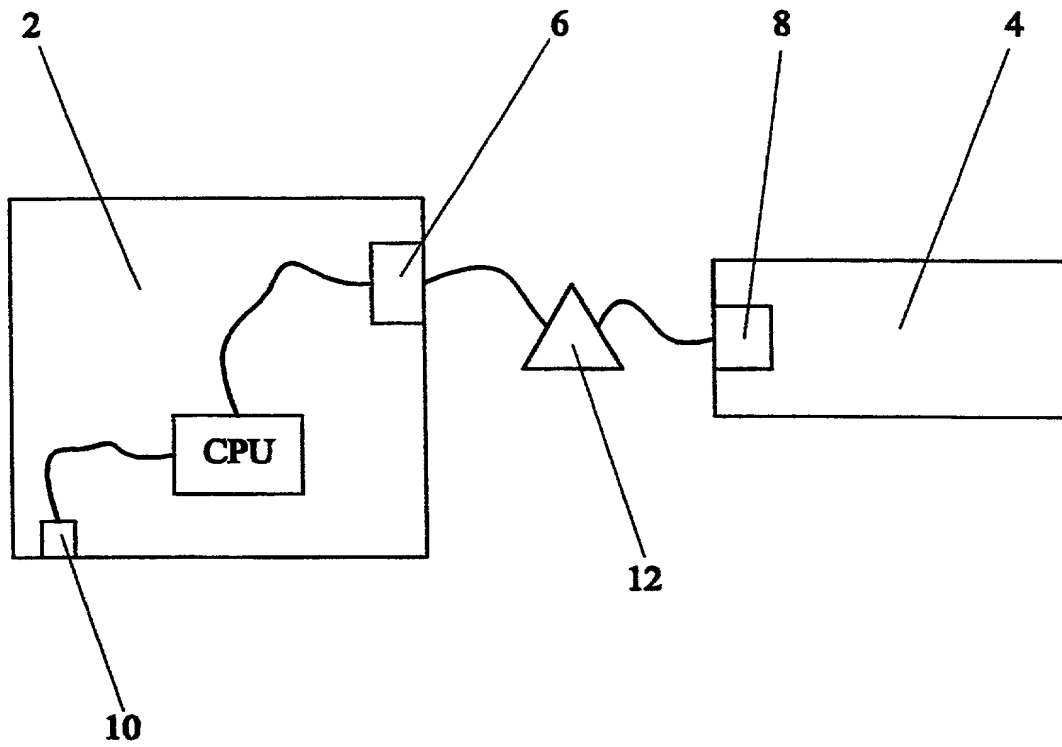
20 17. A method according to any one of claims 11 to 16, in which the first input channel comprises a first peripheral input device.

18. A method according to claim 17, in which the first
25 peripheral input device comprises a keyboard and the security device is located to receive signals from the keyboard and transmit them to a keyboard controller or to a bus.

30 19. A method according to claim 17 or claim 18, in which the device is located between the keyboard controller and the keyboard bus.

20. A method according to any one of claims 11 to 19, in which the apparatus further comprises a control unit (such as a CPU) which interrogates the security device to determine whether a correct password has been entered.

-1/1-

FIG. 1

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PTO/SB/01 (10-00)

Approved for use through 10/31/2002 OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☐ Declaration Submitted with Initial Filing OR ☒ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	148/257
First Named Inventor	ABDULHAYOGLU, Melih
COMPLETE IF KNOWN	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

IMPROVEMENTS IN AND RELATING TO DATA PROCESSING APPARATUS AND VERIFICATION METHODS

(Title of the Invention)

the specification of which

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) 02/16/2001 / as United States Application Number or PCT International (if applicable).

Application Number and was amended on (MM/DD/YYYY)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
GB 9818184.5 ✓	Great Britain	08/20/1998 ✓	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

[Page 1 of 2]

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NAME OF SOLE OR FIRST INVENTOR :

☐ A petition has been filed for this unsigned inventor

Given Name

(first and middle [if any]) Melih

Family Name
or Surname

ABDULHAYOGLU

Inventor's
Signature

Date

11 March 2001

Residence: City Bradford, West Yorkshire

GBN
State

Great
Country Britain

Citizenship Great Britain

Mailing Address 10 Hey Street, Bradford

Mailing Address

City West Yorkshire

State

ZIP BD7 1DQ

Country Great Britain

NAME OF SECOND INVENTOR:

☐ A petition has been filed for this unsigned inventor

Given Name

(first and middle [if any])

Family Name
or Surname

Inventor's
Signature

Date

Residence: City

State

Country

Citizenship

Mailing Address

Mailing Address

City

State

ZIP

Country

☐ Additional inventors are being named on the ____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.